

REMARKS

Applicant respectfully requests reconsideration. Claims 1-45 were previously pending in this application. In this response, Applicants principally request reconsideration, make administrative amendments, and add new claims. Claim 42 has been canceled herein.. Claims 1, 2, 5, 16, 20, 24, 36 – 39, 41, and 43-45 have been amended. New claims 46 and 47 have been added. As a result, claims 1-41 and 43-47 are pending for examination with claims 1, 41, 46 and 47 being independent claims. No new matter has been added.

Rejections Under 35 U.S.C. §102

The Examiner rejected claims 1-13, 20-22, 25, 34-42, 44 and 45 under 35 U.S.C. §102 as assertedly anticipated by U.S. Patent No. 6,381,406 (Smith et al – or “Smith”). For the reasons stated below, reconsideration is requested.

Applicants agree that Smith relates to the control of the speed of a DC fan and that to this extent it is superficially similar to the present invention. However, Smith et al control fan speed in a way quite different than that claimed herein. Smith et al use an externally provided speed signal called SYNC (see, for example, Step 201 of Figure 3). Applicants addressed Smith et al in their specification (see page 4, line 19 to page 5, line 15), where it is expounded that the synchronization is achieved by relating the externally provided SYNC signal with the TACH signal from the fan. Problems with this arrangement include the fact that the synchronization operation requires a monitoring and correlation between the speed (SYNC) signal and the TACH signal and can therefore only be implemented in a 4-wire system. The present invention, by contrast, does not require an external SYNC signal. Thus, it can advantageously be implemented in non-4 wire systems.

So, it may now be asked, how does the distinction appear in the claims? As will be explained, the Examiner appears to be misreading the rejected independent claims, for they do expressly distinguish over Smith.

More specifically, the Examiner's attention is directed to clause a) of Claim 1. Apparently, the Examiner is misconstruing this clause. The claim states that the method

comprises, in part, defining an ideal TACH output for a specific rotation speed of a rotor of the DC fan. This is not the same as receiving and monitoring a speed control signal (SYNC), which is the extent of the disclosure in Step 201 of Fig. 3 of Smith et al.

Consider firstly that according to clause a) of claim 1, the present invention, the method requires “defining an ideal TACH output” (emphasis added). Such ideal output is a user-defined construct. There is nothing comparable present in Smith. Rather, Smith discloses monitoring of a physical signal, the SYNC signal. The distinction has practical significance. For example, Smith requires an additional wire within the system. For this reason alone, claim 1 distinguishes over Smith et al.

Consider secondly that Claim 1 details changing the period of the drive signal “such that the period of the drive signal matches the time taken for the fan to rotate through one magnetic pole.” Smith et al does not meet this limitation as it does not disclose such a periodicity. In fact, to the contrary, Smith et al requires the fan to rotate through at least two poles. If one examines the timing diagram of Fig. 2 of Smith et al, one will observe that the PWM_OUT signal is only triggered on the rising edge of the TACH signal. As a result, it is every second pole that is utilized. This is not a trivial distinction. So, for this reason alone, claim 1 patentably distinguishes over Smith et al.

In other words, for *each* of the above two reasons, at least, claim 1 is novel over Smith et al and the rejection should be withdrawn as to claim 1 and its dependent claims.

Independent claim 41 contains similar language and is likewise not anticipated.

Therefore, the rejection under Section 102 should be withdrawn as to all claims.

Rejections Under 35 U.S.C. §103

The Examiner has made three rejections stating that certain claims are unpatentable under 35 U.S.C. §103(a) over Smith et al in combination with other references. Specifically, dependent claims 14-15, 16-19 and 23-24 stand rejected.

Before addressing each separate rejection, Applicants direct the Examiner’s attention to the fact that the rejected claims are dependent claims, depending directly or indirectly from claim 1. Claim 1 is assuredly novel over Smith, for reasons given above, and the secondary references

(Getz, Karwath et al and Tsai et al all fail to teach modifying Smith et al to provide the limitations of claim 1 that Smith fails to meet. Hence, one truly need go no further to realize that the three rejections for obviousness must be withdrawn.

Moreover, it would not have been obvious to a person of ordinary skill in the art to modify the 4-wire system of Smith et al to provide a system and methodology in accordance with the rejected claims. Smith's architecture and methodology address a specific set of system requirements involved in synchronizing a 4-wire system. Availing of all possible hardware inputs, Smith et al provides a solution. The person ordinarily skilled in the art could not apply the solution of Smith et al to a *non 4-wire arrangement*. Therefore, such a person would not have been motivated to change Smith et al in a major architectural way. It works in the manner it is intended, for the architecture/environment in which it is supposed to operate. Nothing in Smith or the other art suggests anyone would have been motivated to transform Smith in a major way to make it some thing it is not. Moreover, to do so would render Smith no longer useful for its intended purpose as it could not fulfill the needs of a 4-wire system once transformed. It is legally improper to suggest one skilled in the art would have altered the primary reference so that it could no longer fulfill its intended mission.

The system of Smith et al bases its control of the fan on a locking of the externally provided SYNC to the TACH. This approach suffers in that there is no information provided from the fan as to the actual operation of the fan, and as it only triggers the PWM_OUT signal on every second pole and never during the off period it does not have the same level of information as to actual operation of the fan, as is provided to the controller of the present invention, which samples at every pole. This provides for wider speed operation and also reacts quicker to rapid fluctuations in fan speed, which would simply not be observed using the system of Smith et al.

The Office Action is therefore incorrect to hold that the differences between the claimed invention and Smith are obvious differences, and that the secondary references teach or suggest the path to modify Smith to arrive at the claimed invention.

Some further, brief comments will be offered with respect to the specific rejections. It is not intended that these remarks be comprehensive, as they are actually not required, in light of

the foregoing. The absence of more detailed comments is not intended to suggest acquiescence in any of the Examiner's remarks.

For example, the Examiner has made specific comment with regard to claims 14 & 15. With reference to claims 14 and 15, the Office Action rejects such claims over Smith in view of Getz et al, Pat. No. 6,940,235. Irrespective of the argument above, it will be noted that these claims refer to a sampling during an OFF time of operation. Neither reference details how to sample during the OFF time. In fact, they explicitly only provide for sampling during an ON time. Thus, in the teachings of the prior art there is a "black window" during the OFF period, i.e. a time where no information is gleaned. Claims 14 and 15 explicitly require sampling during the OFF period. By sampling (a) more frequently and (b) during the OFF time, the controller of the present invention may anticipate fan speed changes and adjust accordingly. This is not possible using the prior art arrangements. Consequently, even if Applicants were to concede the existence of a proper motivation to combine the references, which Applicants most assuredly do not, there are at least three reasons the resultant combination would not provide the claimed invention: the two reasons given regarding Smith's failings in connection with claim 1 (which likewise apply to Getz) and this additional failing that sampling is not done during the OFF interval.

With reference to claims 16-19, the Office Action rejects such claims over Smith in view of Karwath et al, Pat. No. 6,825,625. Claim 16 adds to claim 1 that the defined "ideal" TACH output is provided by a look up table. There is no such ideal TACH output in either reference, lookup table or no. Consequently, even if Applicants were to concede the existence of a proper motivation to combine the references, which Applicants most assuredly do not, there are at least three reasons the resultant combination would not provide the claimed invention: the two reasons given regarding Smith's failings in connection with claim 1 (which likewise apply to Karwath) and this additional failing that there is no disclosure that the defined "ideal" TACH output is provided by a look up table.

With reference to claims 23 and 23, the Office Action rejects such claims over Smith in view of Tsai et al , Pub. No. 2004/0263105. Claim 23 adds to claim 1 that the defined ideal TACH output is provided by a plurality of user inputs (claim 20) including the number of poles

of the fan and a rotation speed of the fan (claim 21), and that the rotation speed of the fan is related to an operating temperature, the relationship being user defined. The thinking behind the rejection is, to say the least, unclear. The Examiner does not even mention the requirement for user control of the speed-temperature relationship. Further, no attention is given to the requirement that the defined ideal TACH output be provided by a plurality of user inputs. For these reasons and those given above, even if Applicants were to concede the existence of a proper motivation to combine the references, which Applicants most assuredly do not, the resultant combination would not provide the claimed invention.

These are just some examples of how the Examiner's reasoning or understanding is flawed with respect to the analysis of the dependent claims.

Accordingly, the three obviousness rejections all should be withdrawn.

Allowable Subject Matter

The indication that claims 26-33 and 43 contain allowable subject matter is appreciated. Applicants hold in abeyance any rewriting of such claims until this response is considered..

Claim Amendments

Claims 1, 2, 5, 16, 20, 24, 36 – 39, 41, and 43-45 have been amended. For the record, Applicants note that these amendments are unrelated to the rejections set forth in the Office Action. The amendments are of two types: (1) amendments to alter dependencies so that some claims now depend multiply from claim 1 and 46 or from 41 and 47, and (2) amendments made to remove reference to "steps" in order to avoid any unintended basis for an argument that the method claims should be construed in accordance with 35 U.S.C. 112, sixth paragraph. The method claims are not intended to invoke that statute.

New Claims

New claims 46 and 47 are added to claim aspects of the invention not previously claimed. These two new claims derive from claims 1 and 41 and add that defining the ideal TACH signal

is based on a time period for the rotor to rotate passed two adjacent poles. As discussed above, this limitation is not found in Smith et al or any other references discussed above. The specific recitation of this time period provides clarification that the ideal TACH signal does not require an externally provided wire to the controller, in contrast to the externally provided SYNC signal of Smith et al.

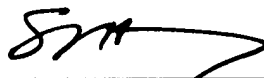
CONCLUSION

All claims are in condition for allowance. A Notice of Allowance is respectfully requested. The Examiner is requested to call the undersigned at the telephone number listed below if this communication does not place the case in condition for allowance.

If this response is not considered timely filed and if a request for an extension of time is otherwise absent, Applicant hereby requests any necessary extension of time. If there is a fee occasioned by this response, including an extension fee, that is not covered by an enclosed check, please charge any deficiency to Deposit Account No. 23/2825.

Respectfully submitted,

By:



Steven J. Henry, Reg. No. 27,900
Wolf, Greenfield & Sacks, P.C.
600 Atlantic Avenue
Boston, Massachusetts 02210-2206
(617) 646-8000

Docket No.: H0682.70007 US00
Date: May 5, 2006
x05/24/06x